

ILLUMINATED ORNAMENTATION/AMUSEMENT DEVICE**BACKGROUND OF THE INVENTION**

This invention relates to improvements in wearable illuminated ornamentation or amusement devices. More particularly, the invention pertains to an article which may be incorporated or other affixed or secured onto wearable apparel, accessories, decorative items, toys or games, including for instance hats, jackets, shirts, backpacks or shoes.

Illuminated decorative objects have been known for sometime which provide illumination of the LED through a battery source. Examples include U.S. Patent Nos. 5,018,053, 5,253,149 and 4,009,381. These patents use a lighting source such as an LED powered by a battery and connected onto attachable clips, posts or the jewelry itself and are intolerant to impact, modification or flexibility of the items. The purpose of the LED's is to project light, and hence to illuminate another object.

In other prior illuminating devices, lighting of object is performed using fiber optics to obtain a back lighting which is relatively low in intensity when used for flat image or surface viewing. The optical fiber is usually not positioned directly under or integrated within the item to be illuminated making previous patents less efficient, vulnerable to separation, impact or flexibility. Thus, although such prior devices are known to serve their purposes, they have

proven to be neither satisfactory nor do they reach maximum exploitation of uniform light illumination.

Thus, a need thus exists for an even more improved flexible, thin-format, light transmissive device which will insure even distribution of brightness while providing maximum illumination for logos, images or items within or on the surface of said item.

SUMMARY OF THE INVENTION

A light source, such as an LED (light emitting diode), is inserted into a cavity accessible from the back of a clear or translucent light transmitting pliable molded unit, which could be PVC, and could have a logo, image or other graphic element imbedded within or disposed on the surface of said unit. The unit is preferably molded into a three dimensional or planar configuration designed and constructed so as to allow the light to scatter evenly through the unit and illuminate graphic element. The light source is connected to an energy supply, which is typically a battery, through a switching mechanism. The switching mechanism may be either simple on/off switch, or it may be an electronic timing circuit which can turn the source on or off cyclically at a predetermined or variable duty cycle and frequency. Alternatively, a motion-activated switch, or a switch operating randomly may be used as well.

BRIEF DESCRIPTION OF THE DRAWINGS

Preferred embodiments of the present invention are illustrated in and by the following drawings in which like reference numerals indicate like parts and in which:

5 **FIG. 1** is an exploded top view with a pliable plastic unit in accordance with the present invention.

FIG. 2 is a side elevational view of the unit of Fig. 1.

FIG. 3 is a partial side sectional view of the pliable unit of Fig. 1.

10 **FIG. 4** is a side view of an alternate embodiment having two cavities.

FIG. 5 is a side view of the unit of Fig. 1 showing the LED being inserted therein.

15 **FIG. 6** is a side view of the unit of Fig. 2 with the LED being inserted therein;

FIG. 7 is a top external view of an electronic unit used to control the LEDs of Fig. 5 or 6.

FIG. 8 is a top view of the electronic unit of Fig. 7 with the top removed.

20 **FIG. 9** is an exploded view of an alternate embodiment formed of an assembly of a translucent unit and a single unitary member including two LEDs and the electronic circuitry.

25 **FIG. 10** is an exploded side view of the assembly of Fig. 9. a pliable unit with one cavity and a fully self contained electronic unit.

FIG. 11 is a top view of a first molding piece.

FIG. 12 is a side view of the molding piece of Fig. 11.

FIG. 13 is a top view of a second molding piece.

FIG. 13a shows a cross-sectional view of the molding pieces of Figures 11-13 assembled to form the plastic unit of FIGS. 1-4.

FIG. 13b shows the assembly of the two molding pieces of FIGS. 11-13.

FIG. 14 is a front view of a hat having a pliable illuminated unit constructed in accordance with this invention.

FIG. 14a is a side elevational view of the hat of Fig. 14.

FIG. 15 is an elevational view of a backpack with an illuminated in accordance with this invention.

FIG. 16 is a front view of a jacket incorporating an illuminated unit in accordance with this invention.

DETAILED DESCRIPTION OF THE INVENTION

Generally speaking, the present invention is directed to an lighted or illuminated ornamentation or amusement device comprising, a relatively thin, light- transmissive unit, a light source and a power source providing energy to the light source. A switching mechanism is also provided for selectively activating the light source. The unit is preferably flexible or pliable and is made of a plastic material such as PVC. The unit has a somewhat three dimensional or planar configuration and has a top surface on which there is formed customized image, a logo or other

graphic elements. Alternatively the image may be imbedded into the unit. The unit is secured by sewing or other means to a wearable apparel, accessory, decorative item, a toy or a garment so on.

5 More specifically, referring to Figs. 1-3, a unit 13 is shown as having a generally circular, oval or ellipsoid shape with a top surface 16 and a bottom surface 16A. Of course, unit 13 may have any other shape as well. The unit 13 is made pliable so that it can be bent as illustrated by the dotted lines in Fig. 2. Top surface 16 includes one or more graphic elements 11 which form a predetermined design. The elements 11 may be painted onto surface 16 or maybe imbedded into the unit 13.

10 The unit 13 also has a circumferential lip 12 which may be used to secure the unit 13 to a garment or other article. The top surface 16 may be separated from the lip by a cylindrical side wall 14. The unit 13 is formed with a cavity 17 disposed at the center of the unit 13 and extending into the unit 13 from bottom surface 16A. Cavity 17 is structured to receive a light-source such as an LED 20 (shown in Fig. 5) which transmits light evenly through unit 13 as indicated in Fig. 1 by arrows R. More particularly the light from source 20 is transmitted uniformly around and through said unit 13 and highlighting the graphic elements 11. Fig. 4 shows that instead of a single LED receiving cavity, the unit 13 can be made with two or more cavities 18, 19, each receiving an appropriate light source.

Referring now to Fig. 5, LED 20 is shaped and sized so that it can be inserted into cavity 17. A wire 21 connects LED 20 to a male plug 22.

There is also provided an electronic unit having a housing 30 with a female plug 25 for receiving male plug 22. Housing 30 also has a cover 24 with an activating switch 23. The switch 23 may be used to selectively activate LED 20 and as such, it may be an off/switch or a motion detector switch. Alternatively, as shown in Fig. 8 in which cover 14 has been removed, housing 30 may include a cavity C for a battery (not shown) and a PC board 29 with an electronic chip 28. Chip 28 may be activated by switch 23 to turn LED 20 on and off in a cyclical pattern. Alternatively, chip 28 may activate the LED in a random pattern.

Fig. 6 shows two LEDs 20, 20a inserted into cavities 18, 19 respectively and connected to the electronic unit by male plug 22.

Of course, instead providing the LED and electronic unit as separate elements requiring a connecting wire and male and female connectors, a single housing 31 may be provided with the LED 20 extending outwardly. Figures 9 and 10 show a possible combination for this embodiment.

In these figures, unit 29 is provided not only with an LED 20, but also batteries 31. For this purpose, cavity 17 is enlarged so that unit 29 can fit within.

FIGS. 11 and 12 shows the top and side view respectively of a molding piece 35 usually generated by C.A.D., (computer

aided design). The piece 35 could be cut out of brass or aluminum, or other similar materials.

The unit 35 has three specifically spaced circular pegs 32, 33, 34.

5 The second molding piece 36 is generally flat and is formed on its top surface with two holes 37 and 38. In between these holes, a cavity 40 is formed in the size and shape of the plastic unit to be formed, such as, for instance, the plastic unit 13 of Figures 1-3. In order to make unit 13, molding piece 35 is placed over piece 36 and lowered (as seen in Fig. 13B) until pins 32 and 34 fit into holes 38 and 37 as best seen in Fig. 13a. Once the piece 35 is in place plastic material is poured into cavity 40 to generate unit 13.

10 The primary usage of the usually circular pegs 32, 34, are for joining and stabilizing both mold pieces 35, 36 insuring the specific placement, setup and quality of the intended poured images on unit 13, while circular peg 33, is specifically designated and designed to form the cavity 17 of the LED. Additional or different pegs may be used for forming cavities for electronic units or other items.

20 Figures 14, 14a, 15 and 16 show an assembly 42 attached to various types of articles such as a hat, a backpack or a jacket. In each case, the assembly 42 can be made of discrete parts as shown in Figure 5 and 7, or a single housing such as shown in Figure 9 and 10.

25 Obviously numerous modifications may be made to this invention without departing from its scope as defined in the appended claims.

